sufficiently attenuated and can result in an incorrectly received bit if the bandwidth of the receiver in the higher speed module is too high.

There are two known autonegotiation methods to alleviate the above problems. The first uses clock recovery techniques to detect the data rate wherein the fundamental clock frequency of an incoming data stream is detected and regenerated. Circuits that perform this function are widely available and the technology is mature. Nevertheless, a reference clock signal is required along with a clock recovery circuit in order to determine the actual frequency of the recovered clock and therefore the bit rate of the transmitted data. The other known method to alleviate this problem is to implement a switchable bandwidth receiver wherein the bandwidth of the receiver is lowered for low-speed operation and maintained at it's highest value for high-speed operation, such as disclosed in U.S. Serial No. 09/574,239 (~~Docket ROC 92000 0029~~) now U.S. Patent 6862322 entitled *Switchable-Bandwidth Optical Receiver*, filed 19 May 2000, which is commonly owned by the assignee herein and which is incorporated by reference in its entirety. The described method provides a control signal to an optical transceiver that modifies certain aspects of the transceiver's performance to allow operation at multiple bit rates. Even a switchable-bandwidth receiver as described, however, requires a control signal to determine when the receiver's bandwidth needs to be modified.

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There is thus a need in the industry for a low cost, easy-to-implement, and fully self-contained data rate detector and a method of data rate autodetection that allows selection of the data rate of an incoming digital signal without an external control signal or complicated clock recovery schemes.

This data rate detector is preferably implemented in optical transceiver modules designed to operate at multiple bit rates, such as transceiver modules designed to operate at both 1.0625 Gb/s and 2.125 Gb/s. Transceivers that implement the data rate detector are able to automatically detect the signaling rate of an input signal and adjust critical performance parameters, such as receiver bandwidth, to ensure proper operation. Additionally, autonegotiation between transceivers becomes an easier problem to solve because the data rate detector described herein, when combined with the switchable-bandwidth receiver described in U.S. Serial No. 09/574,239 now US Patent 6862322 entitled *Switchable-Bandwidth Optical Receiver* filed 19 May 2000, guarantees that the transceiver containing it will always operate properly at any appropriate bit-rate. Because the method of data rate autodetection described herein is relatively simple, it has a lower cost and is easier to implement than complex clock recovery circuits that typically require an oscillator to operate.

While the invention has been described in connection with what is presently considered the most practical and preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.